REMARKS

Claims 1 through 13 and 15 through 23 are now pending in the application. In response to the Office Action of January 29, 2004, claim 14 has been cancelled, claims 3, 4, 7, 12, 13 and 15 have been amended, and an amended abstract has been provided. Claims 19 through 23 stand withdrawn. Care has been taken to avoid the introduction of new matter. Favorable reconsideration of the application is respectfully solicited.

Objection has been made to the abstract for the presence therein of the phrase "comprising." In response, a replacement abstract has been submitted herewith that eliminates the objectionable term.

Claims 1, 3, 10 through 12 and 14 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. patent 5,216,339 (Skybyk). It is well settled that anticipation, under 35 U.S.C. § 102, requires that each element of a claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference. *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983); *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ2d 1920 (Fed. Cir. 1989) *cert. denied,* 110 S.Ct. 154 (1989). The term "anticipation," in the sense of 35 U.S.C. § 102, has acquired an accepted definition, *i.e.*, "the disclosure in the prior art of a thing substantially identical with the claimed invention." *In re Schaumann*, 572 F.2d 312, 197 USPQ 5 (CCPA 1978). To satisfy the burden of establishing a basis for denying patentability under 35 U.S.C. §102, therefore, each and every element of the claims under rejection must be shown by the Office Action to be disclosed in Skybyk.

Page 3 of the Office Action presents a purported correlation between Skybyk and elements of the claims. It is respectfully submitted that Skybyk does not disclose a motor that is identical to the claimed requirements.

Independent claim 1 recites, *inter alia*, the following:

> *a stator* comprising a *plurality* of *separate, ferromagnetically isolated* electromagnets in an annular ring configuration, windings of the electromagnets selectively energized to form magnetic poles of alternating polarity along a *radial air gap* that separates the stator from the rotor . . . (emphasis supplied).

Independent claim 12 has been amended to recite that the rotor and stator are separated by a radial air gap. Claims 3, 10 and 11 are dependent from claim 1. Claim 14 has been cancelled.

Skybyk is directed to a motor "comprised of a disk rotor sandwich between two toroidal stators with an axial air gap separating the rotor and stators (column 1, line 38+)." It is clear from Fig. 2 of the drawings, as well as from the specification, that only a motor having an axial air gap between stator and rotor is disclosed. The fourth paragraph of page 3 of the Office Action is incorrect with respect to this structure. Air gap 25 is not a *radial* air gap. The requirement for a radial air gap configuration in each of the rejected claims, which is not disclosed in the reference, is at least a first basis for distinguishing all of the above-identified claims from Skybyk under 35 U.S.C. § 102.

Claim 1 and claim 12 both also require that a single stator comprise a plurality of separate, ferromagnetically isolated electromagnets (claim 1) or a plurality of independent stator units (claim 12). The meaning of these terms is clear from the specification, for example, at page 9. Ferromagnetically isolated elements are described therein as core segments, made of magnetically permeable material, that are separated from direct contact with each other.

Skybyk discloses two separate stators. It is evident from column 1, lines 47 - 61, that Skybyk considers the stators 26 and 27 of Fig. 1 to be two separate stators, and not to be considered two elements of a single stator. As stated in Skybyk:

> Each stator is an independent member and as such can drive the rotor as a separate electric motor, in the single stage drive mode. . . . The net result is in effect the same as if two independent motors were coupled to the same shaft in order to drive a heavy load.

As shown in Fig. 1, each stator comprises a plurality of sets of coils that are situated at regular intervals about slots in a continuous laminated block assembly. The coil sets are connected to each other in various embodiments as shown in the drawing figures. The fourth paragraph of page 3 of the Office Action is incorrect with respect to this structure. Skybyk lacks a disclosure of a single stator that comprises a plurality of separate, ferromagnetically isolated electromagnets. The stator lamination block of Skybyk is not formed of ferromagnetically isolated core segments, each with a winding separate from the others, to form separate electromagnets or independent stator units. Such lack of disclosure is at least a second basis for distinguishing all of the above-identified claims from Skybyk under 35 U.S.C. § 102.

Claim 11 is dependent from claim 1 and requires that the separate power modules be contained within the stator assembly and radially inward of the stator electromagnets. The assertion in the Office Action (first sentence of page 4) that Fig. 1 of Skybyk shows power modules being contained within the stator radially inward of the stator electromagnets is incorrect. Neither Fig. 1 nor Fig. 2 discloses power modules. There is nothing in Fig. 13, to which the Office Action refers, nor elsewhere in the patent disclosure, that describes power modules, let alone that individual power modules are associated with respective separate stator electromagnets and located within the stator.

Dependent claim 3 has been amended to change its dependency from claim 1 to claim 11. Claim 3 thus requires that the plurality of separate power modules be contained within the stator and radially inward of the stator electromagnets, and that each power module comprise drive

circuitry and electronic switches responsive to the drive circuitry of the module. Such lack of disclosure is an additional basis for distinguishing claims 3 and 11 from Skybyk under 35 U.S.C. § 102.

Claims 2, 4 through 6, 8 and 9 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Skybyk in view of U.S. patent 6,586,857 (Hsu). Legal precedent is well developed with respect to 35 U.S.C. §103. As stated in *Graham v. John Deere Co.* 383 U.S. 1, 13, 148 USPQ 459, 465 (1966), obviousness under 35 U.S.C. §103 must be determined by considering (1) the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims in issue; and (3) resolving the level of ordinary skill in the pertinent art. The PTO is thus charged with the initial burden of identifying a source in the applied prior art for: (1) claim features; and (2) the realistic requisite motivation for combining applied references to arrive at the claimed invention with a reasonable expectation of successfully achieving a specific benefit. *Smith Industries Medical Systems v. Vital Signs,* 183 F.3d 1347, 51 USPQ2d 1415 (Fed. Cir. 1999). This burden is not met if there is no showing that the combination of references would actually meet all the limitations of the claims under consideration.

An Office Action rejection must provide a reason why one having ordinary skill in the art would have been led to modify the prior art or to combine prior art references to arrive at the claimed invention. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 227 USPQ 657 (Fed. Cir. 1985); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967). The examiner should recognize that even if the prior art *could* be modified so as to result in the combination defined by the claims the

modification would not have been obvious unless the prior art suggested the desirability of the modification. *In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986). In the absence of such a prior art suggestion for modification of the references, the basis of the rejection is no more than inappropriate hindsight reconstruction using appellant's claims as a guide. *In re Warner*, 379 F.2d 1011, 154 USPQ 173 (CCPA 1967).

What may or may not be known in general does not establish the requisite realistic motivation to support the ultimate legal conclusion of obviousness under 35 U.S.C. §103. *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995). The requisite motivation is not an abstract concept, but must stem from the applied prior art as a whole and have realistically impelled one having ordinary skill in the art, at the time the invention was made, to modify a reference in a specific manner to arrive at a specifically claimed invention with a reasonable expectation of achieving a specific benefit. *In re Newell,* 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989). It is submitted that the prior art does not meet these criteria for any of the claims under rejection.

Each of claims 2, 4 through 6, 8 and 9 depends, either directly or indirectly, from claim 1. As set forth above, the parent claims contain several requirements that are not disclosed by Skybyk. Neither Skybyk nor Hsu, taken individually or in combination, would have suggested to one of ordinary skill in the art: a single stator comprising a plurality of separate, ferromagnetically isolated electromagnets; separate power modules associated with respective separate stator electromagnets, contained within the stator assembly and radially inward of the stator electromagnets; and each power module comprising drive circuitry and electronic switches responsive to the drive circuitry of the module.

With respect to the holding by the Office Action that it would have been obvious from the Hsu disclosure to modify the Skybyk motor to encompass the stator within the rotor, thereby meeting the added requirements of claim 2, applicant takes issue with this position. Skybyk discloses a "disk rotor sandwich[ed] between two toroidal stators with an axial air gap separating the rotor and stators (column 1, line 38+)." Hsu discloses a radial air gap machine (Figs. 2, 3) having a single stator and a single rotor. Either one of the stator or rotor of Hsu may, in the alternative, be positioned within the other across the radial air gap. The Hsu machine corresponds to the description in the background section (column 1, line 16+) of Skybyk of a prior art device that is in contradiction to the intended invention of Skybyk. The Office Action does not state precisely how the Examiner intends to encompass a stator of Skybyk within the rotor, nor would one of ordinary skill in the art have been capable of comprehending such a modification without destroying the invention intended by Skybyk.

Dependent claims 4, 5 and 6 all contain the requirements of claims 1, 3 and 11. Claims 8 and 9 are dependent from claim 3. With respect to claim 4, contrary to the assertion in the first sentence of page 6 of the Office Action, Hsu has no disclosure of power modules associated with respective stator electromagnets, each module comprising a circuit board having mounted thereon respective drive circuitry and respective switches. No circuit boards can be seen in Fig. 1, nor does the specification discuss such circuit boards. Thus a person of ordinary skill in the art would have had no motivation to modify the Skybyk motor by providing individual circuit boards. Claims 5 and 6 are dependent from claim 4.

Claim 7 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Skybyk in view of U.S. patent 5,808,448 (Naito). Claim 7 is dependent from claim 3 and thus contains all the requirements of claims 1, 3 and 11. Naito does not disclose, nor has it been relied upon in

the Office Action for disclosure of, those features of the parent claims identified above that are lacking in Skybyk. Claim 7 additionally requires a plurality of batteries contained within the stator, each of the batteries supplying power to only one of the modules. Naito, which was relied upon in the Office Action for disclosing a plurality of batteries, teaches combining fuel cells and storage batteries for use for meeting a wide range of output power requirements, *e.g.*, hybrid battery used as an electric power source for driving an electric vehicle. There is no teaching or suggestion that a person of ordinary skill in the art would have taken heed from Naito to incorporate a plurality of batteries within a motor stator, let alone within power modules respectively associated with a plurality of individual stator units. The Office Action is silent as to how Skybyk is to be modified to incorporate batteries such as disclosed in Naito within a stator, leaving the configuration of such an arrangement to conjecture. It is inconceivable that an artisan would have been compelled to devise such a modification that is in reasonable compatibility with the Skybyk disclosure.

Claims 13 and 15 through 18 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of U.S. patent 5,486,727 (Heidelberg). Claims 13 and 15 are independent; each recites a stator that comprises a plurality of independent stator units, each of the units comprising a ferromagnetically isolated core. Claims 16 through 18 are dependent from claim 15. The Office Action (paragraph 9) has ignored this requirement in its statement of the rejection, stating simply that Hsu teaches the claimed invention, except for the added requirement of a power supply for each stator unit.

As is evident from Fig. 2, Hsu discloses a stator with a continuous core having cutouts provided for the formation of windings about the poles formed in the core. No ferromagnetic

core isolation of independent stator units is disclosed or suggested by Hsu, nor would provision of such a modification have been suggested by consideration of the teachings of Heidelberg.

Claims 13 and 15 additionally require a separate power supply for each ferromagnetically isolated core. The Office Action describes Heidelberg as disclosing a plurality of stators, each connected to a power supply "to permit optimal regulation of each stator in accordance with a position of [a] rotor." The conclusion is then reached that "it would have been obvious . . . to modify Hsu's motor with each stator unit connect[ed] to a power supply as taught by Heidelberg." The Office Action is silent as to how such a modification is to be made and what structure would result from the modification.

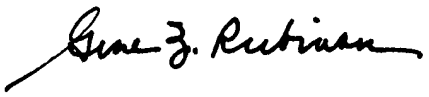
It is submitted that, with respect to the modification generally mentioned in the Office Action, Hsu and Heidelberg are incompatible with each other. In contrast with the conclusion in the Office Action, a person of ordinary skill in the art would not have contemplated, let alone been compelled, to provide Hsu with a plurality of batteries. As stated above, the Hsu rotary motor has one continuous stator core, not a plurality of separated stator cores. The three phase stator windings of Hsu are connected in typical fashion to the output of a bridge inverter circuit powered by a single battery source to drive the motor in continuous rotation. Heidelberg is directed to a linear drive motor. The Heidelberg motor does not have a rotor in the sense of the Hsu rotary device, but has a "runner" that is driven by an accelerator that comprises a plurality of longitudinally displaced stators, each equipped with a separate power supply. The purpose of Heidelberg (column 1, 19+) is to "giv[e] the runner a very strong acceleration for a relatively short path." The rationale for modification in the Office Action that "doing so would permit optimum regulation of each stator unit in accordance with a position of a rotor" makes no sense, especially in light of the fact that Hsu discloses only one stator core. The Office Action does not

explain why an artisan would have considered that optimum regulation of ram acceleration of a linear motor is applicable, let alone compelling, to modification of a rotary motor. A person of ordinary skill in the art would not have been led to essentially destroy the disclosed and intended structure of Hsu to add features solely to meet the requirements of the claims, which were unknown in the prior art at the time of the invention.

Accordingly, it is submitted that all rejections of record have been overcome as discussed above. Withdrawal of the rejections and allowance of the application are respectfully solicited. To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

MCDERMOTT, WILL & EMERY



Gene Z. Rubinson
Registration No. 33,351

600 13th Street, N.W.
Washington, DC 20005-3096
(202) 756-8000 GZR:lnm
Facsimile: (202) 756-8087
Date: April 26, 2004